NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

PRECISION LAND FORMING
(acre)
CODE 462

DEFINITION

Reshaping the surface of land to planned grades.

Scope

This standard applies to all precision land-forming operations for drainage and erosion control as well as other purposes such as moisture conservation, leaching, and improving water quality.

PURPOSES

To improve surface drainage, provide land-forming operations for drainage and erosion control as well as other purposes such as moisture conservation, leaching, and improving water quality.

CONDITIONS WHERE PRACTICE APPLIES

On all land that is suitable for the purpose required and where precision land forming is practical. Soils shall be of sufficient depth and of suitable textures so that after precision land forming is completed an adequate root zone remains to permit the planned use of the land and application of proper conservation measure, soil amendments, and fertilizer.

This standard does not apply in areas needing land smoothing (466), or recreation land grading and shaping (566), and irrigation land leveling (464).

CRITERIA

All precision land forming shall be planned as an integral part of an overall system to facilitate the conservation use of soil and water resources.

Design and installation shall be based on adequate engineering surveys and investigation. If the land is to be formed for more than one purpose, it must be formed to meet the requirements of the most restrictive purpose and crop.

All forming work must be designed within the slope limits required for the proposed use and provide for the removal of excess surface water. If other conservation practices such as grassed waterways, drainage field ditches, and filter strips are needed to accomplish the stated purpose, they shall be included in the plans for improvement.

Slope requirements

Slope may be uniform in the direction of flow or may increase or decrease.

Reverse grades in the direction of planned water flow shall not be permitted. Short level sections are permissible to meet field conditions. Cross slopes must be designed so that "breakthroughs" from rainfall runoff are held to a minimum.

Slope to control erosion caused by runoff from rainfall

Design field grades shall be such that erosion caused by runoff from rainfall can be controlled within the limits permissible for conservation farming. When benching between land-formed plots exceeds 1 foot, a permanent grassed area or border ridge must be left between the plots to reduce the possibility of gully erosion.

Surface drainage

All precision land-forming systems shall include plans for removing or otherwise providing for control of excess water.

Designs must provide field elevation and field grades that will permit proper functioning of the planned drainage facilities.

Borrow computations

Excavation and fill material required for or obtained from such structures as benches, ditch pads, and roadways shall be considered part of the precision land-forming design, and the appropriate yardage shall be included when balancing cuts and fills and determining borrow requirements.

CONSIDERATIONS

Cultural Resources Considerations

NRCS's objective is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice will have any effect on any cultural resources.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

NRCS, CA
October, 2003

GM 420, Part 401, the California Environmental Handbook and the California Environmental Assessment Worksheet provide guidance on how the NRCS must account for cultural resources. The Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Water Quantity

1. Effects on the water budget, especially on volumes and rate of runoff, infiltration, deep percolation and evaporation.
2. Potential for changes in plant growth and transpiration resulting from the changes in the volume of soil water.

Water Quality

1. Effects on erosion and the movement of sediment and soluble and sediment-attached substances carried on by runoff.
2. Effects from the use and management of nutrients and pesticides on surface and ground water quality.
3. Short-term and construction effects of installation on downstream water resources.
4. Potential for earth moving to uncover or redistribute toxic materials, such as saline soils, and make them available to water or plants.
5. Downstream temperature changes.
6. Effects on the visual quality of downstream water resources.

PLANS AND SPECIFICATIONS

Plans and specifications for precision land forming shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan must be prepared by the Designer for use by the owner or other responsible for operating this practice. The plan should provide specific instructions for operating and maintaining the system to insure that it functions properly. Such instructions should include periodic checks of drainage structures (field ditches, grassed waterways, etc.) to insure that siltation is not occurring and performing minor maintenance to maintain required field slopes. It should also provide for periodic inspections and prompt repair or replacement of damage components.